

Note on a relic of the Native Flora of Pennsylvania, surviving in Perry County. By E. W. Claypole.

(Read before the American Philosophical Society, May 18, 1883.)

One of the inevitable, but, to the biologist, deplorable consequences of the spread of cultivation, is the extinction of many of the native or wild species of plants and animals. Could we have complete catalogues of the original flora and fauna of any country where nature has been long and entirely subjected to man, we should find many a name which would to us represent no existing being. It would be the name of a member of the aboriginal races which had proved unable, essentially or accidentally, to maintain its ground in the changed circumstances against its former companions, and had consequently died in the struggle. Or it might be, in the case of America, the name of one that, though able to hold its own against all its native competitors, failed in the contest with some of the new species introduced from more highly developed Europe, where for centuries the struggle has been more intense than here. In either case the result has been the same to the species—ultimate extinction.

It is a notorious fact in geology and botany, that many animal and vegetable species from the Old World have crossed the Atlantic in the traces of the white man, either as his friends or his foes, and have squatted on the lands of America, and made themselves as completely at home here as in Europe, some of them much more so. Without entering into the subject at any length, it may suffice to mention among the former, the house fly, the honey bee, the brown rat, the cabbage butterfly, the English sparrow, the currant and apple worm, the wheat midge, and, though some have disputed this, the Hessian fly. Among the latter may be named the white weed, the purslane, the carrot, the parsnip, the chicory, mullein, toadflax, catnip, &c., &c. All these have proved themselves fully competent to hold their own against the native races of America, and even to conquer them by one means or another in the struggle for existence.

Cultivation, however, is a more deadly foe than competition to many of our native species. The axe and the plough change the conditions of life so suddenly and so greatly that many a plant and animal are deprived at once of both food and shelter. Confining our attention now to the former, the plants, we may notice two or three principal causes of the destruction of some of our aboriginal species.

1. The loss of shade resulting from the destruction of timber. The plants of our woodlands and forests cannot all endure the brilliant, blazing sun that pours down upon them when the trees are felled. The direct heat seems fatal to many. The resulting drought destroys more. The moisture-loving ferns, without exception, dislike the sunshine, and though some of them, such as the common polypody, do not require much water, yet they shrivel and die when deprived of shade. It is not too

much to say that were it not for cool, moist glens and caves, where plough and ploughman can never come, many of these beautiful plants, the loveliest ornaments of the herbarium and the garden would have long since disappeared from the land. As it is, many of them, both here and in Europe, are almost extinct. They linger on, their lives hanging by a thread, which accident, or the hand of a ruthless collector, or of an over-eager botanist, may at any time snap asunder. Such are the elegant Killarney fern in Ireland, and the Trowbridge fern in England, and such may before long be the condition of the Hartstongue and the Climbing fern in this country.

2. The competition of native races, and of introduced species under the new conditions, is another element in the problem. Enough, however, has been said above on this point.

3. The cultivation of the ground is a most potent factor in the destruction of many native species. Few, except annual plants, can long survive this incessant disturbance of their roots. Of these consist, for the most part, our weeds. But the perennial species, especially those which require several years to produce seed, and then produce it sparingly; those that are choice of soil and conditions, cannot maintain themselves under cultivation, and soon fail and die.

There are certain species, I may say certain groups, which are less tolerant of man and the conditions which he introduces than others. The gap between them and civilization seems wider than it is in other cases. They are the real "wild" flowers which cannot be tamed, and usually die if the attempt to tame them is made. Like the wild Indian tribes of this continent, who are so far removed from the white man and his ways that their civilization seems scarcely possible, these "wild" denizens of our "wild land" refuse to acknowledge man's supremacy, and die if he tries to assert it.

Among these truly wild flowers are many of the HEATH FAMILY; specially attached to the moor and the forest. Their very name is synonymous with wildness and freedom. The heather of Scotland brings up vividly the breezy moor and brae and fell. It is an emblem of the "land of brown heath and shaggy wood." But the Scotch heather, like many of its relations, refuses to be confined within the garden fence. It is difficult to transplant and difficult to nurse even if successfully transplanted. It seems as a mountaineer imprisoned in a dungeon, impatient of its confinement, and rather than live in such conditions, refuses to live at all. The Mayflower, gem of the spring in North America, manifests similar impatience of confinement, and the same is true of several other members of the family.

In Perry county there lingers one of these survivors of our native flora doing battle for its existence against conditions in which no member of its family can long survive. It is struggling against the inroads of cultivation on its native haunts, and struggling against heavy odds.

In the "Flora of North America," Michaux described *Vaccinium brachy-*

cerum or *pumilum*, the box-leaved huckleberry, a low evergreen plant of the Heath Family, giving as its habitat "near Winchester." Its discovery was a testimony to the thoroughness and minuteness of his work in a day when traveling for botanical investigation in North America meant hardship, privation and even danger. The county was unsettled and uninhabited, and the botanist was compelled to wander over pathless mountains, and through forests where the lumberman's axe had never been heard, and to carry with him the results of his labors on his shoulders, or at best on horseback. Yet in some cases he and his fellow-workers lighted on plants to find which again has required long and painstaking search or lucky accident.

Michaux's description and specimen remained for many years the only evidence of the existence of the Box Huckleberry in the world.

About the year 1846, Prof. S. F. Baird, now Secretary of the Smithsonian Institution, was engaged in teaching at Carlisle, Cumberland Co., Pa., when he was informed by a friend living in New Bloomfield (Thomas McIntyre, Esq., recently deceased) that a plant called in the neighborhood "Boxwood," was growing wild near that town. He paid a visit to the place under Mr. McIntyre's guidance, and obtained specimens of the plant both for the herbarium and for cultivation. The latter he sent to the Botanical Garden at Cambridge. This was Michaux's plant, *Vaccinium brachycerum*. Its existence in Pennsylvania had been previously unsuspected, and it was thought to be a lost species. Prof. Gray kindly informs me that those specimens planted in the Garden nearly forty years ago, are still living, and that the plants bloom, but never produce any fruit. Evidently the climate of New England does not suit the species, or it resents the attempt at domestication.

ITS HABITAT IN PERRY COUNTY.

Vaccinium brachycerum, Michaux, *Gaylussacia brachycera*, Gray, now occupies in Perry county a spot of about ten acres, one mile south of New Bloomfield, the county-seat. This tract lies on a hillside sloping principally to the north-west, and occupied by small timber and laurel. Cultivation has encroached upon it, and so far as I can determine its range was somewhat greater only a few years ago. This is, however, not certain, as Professor Baird does not very clearly recollect how far it spread in 1846. One of the most remarkable facts connected with it is the very sharp line which marks its limit. The wood in which it occurs extends for some distance along the road, but the Box Huckleberry only grows as far as a hollow occupied, in wet weather, by a small stream. Along the right bank of this stream it is found freely, on the left side I have never seen a plant. Hence it is quite possible that the plant has been restricted in its range for a longer time, and that it did not previously occupy the rest of the wood. This is rendered more probable by the fact that in other directions its range is equally restricted, and its limits as sharply defined. It is per-

fectly easy to walk round the space on which it grows, and see a thick mat of it on one side and not a plant on the other. No difference, so far as I can discover, exists to account for this limitation. The soil and subsoil are alike on both sides. Both are timbered, and with the same kind of trees. Slope, exposure, sunshine and drainage are the same. Yet the limitation exists, and is most emphatic.

The most probable conclusion is that we have here a plant to which the conditions of life are becoming or have become unfavorable, and which is very gradually yielding to their ill effects. These have, perhaps, been at work for ages in restricting its range, and would in time have destroyed it. Cultivation, however, is its most formidable foe—a foe which may, in a single season, inflict more injury than natural enemies could accomplish in centuries. Two seasons of ploughing would blot the species out of the county, and, saving the garden specimens at Cambridge, probably out of the world; for Professor Gray informs me that it cannot now be found at the locality given by Michaux in his description, “near Winchester,” or at that given on his specimen, “Warm Spring,” and, with the exception of one small habitat in Delaware, no other place is known in which it has ever been seen.* One or two other supposed habitats, which have been mentioned to me turned out on examination to be erroneous or doubtful.

In its native dwelling place in Perry county, it is now (May, 1883) in abundant blossom, but judging from the appearance of the fruit of last

* With regard to this habitat for the Box Huckleberry I had not been able to obtain any definite information at the time of writing the above paper. Since then, however, I have been favored by A. Commons, Esq., of Faulkland, New Castle Co., Delaware, with a few particulars concerning it. I give an extract from Mr. Commons's letter:

“The Box-leaved Huckleberry was found by me some years ago growing on the banks of the Indian River, near Millsborough, in Sussex Co., Delaware. I have collected it there at various times but none very recently. Another locality was reported to me when at Millsborough, said to be about a mile from the town in an opposite direction, but I did not visit it. I am not aware of its occurrence elsewhere in this State, and the patch here is not large. The locality is at the head of tidewater on this river. It extends along the steep bank which is here 10 or 12 feet in height from a few feet above the water-line to the top of the bank, but not beyond this. My impression is that it may have been introduced by tidal agency.”

A hill-side in Perry Co. and the bank of a tidal river in Delaware, are places affording very different conditions, but Mr. Commons has kindly sent me specimens between which and those from this county I cannot discover the slightest difference.

I may further add that while gathering some of the plants I one day found a small caterpillar feeding on the leaves and spinning them together to form a nest. I put it into a box and it almost immediately went into a chrysalid and in about a month emerged a small Tineid moth with black forewings speckled with white. I sent it to V. T. Chambers, Esq., of Covington, Ky., who has made a special study of this family, and he informs me that it belongs, almost with certainty, to a species described by himself as *Gelechia dubitella*, Chamb., and which has been reported to feed on the Hogweed or Bitterweed, *Ambrosia artemisiifolia*.

year, it does not produce seed very freely. If this is true, one potent cause of its diminution and decay is obvious.

Like some other plants apparently also verging towards extinction, such as the Big Trees of California, this little survivor of the old flora of Pennsylvania shows no disposition to spread in Perry county, even in directions where it is unmolested. Ground lost by such a species cannot well be recovered. Point after point has been ceded to its foes; it has been killed off here and headed back there till now it lingers on this hillside, its last stronghold in the State, and almost in the world. What special causes have enabled it thus and there to maintain its ground against its foes it is impossible to say, but its position is very precarious. A little more cultivation, a little more ploughing and harrowing, a little more "clearing up" and "burning of brush," by the farmer, unaware of the value of what he was destroying, and the little Box Huckleberry will be numbered with the things that were and are not. Its only chance lies in the steepness and sterility of the hillside, which all botanists must hope will enable it long to maintain the unequal contest against so many dangerous foes. Perry county and Centre township will then continue to boast the possession of a natural botanical garden, containing one of the most interesting vegetable relics on earth.

APPENDIX.

August, 1883. The fruit of the Box Huckleberry is now ripe, and compared with that of other species is scanty. The berries grow singly and not one plant in ten is productive. They are edible, but lack sweetness, and are hence perhaps less attractive to animals. The blossom in early May was profuse, more so than that of its kindred species. The fruit is of the same size as theirs and is covered with a bloom like that of the low blueberry.

On the Equivalent of the New York Portage, in Perry County, Middle Pennsylvania.

(Read before the American Philosophical Society, September 21, 1883.)

THE CARDIOLA SHALE.

About 200 feet above the Fenestella shale, the topmost bed of the 300 feet of Hamilton Upper shale, which in Perry county is the highest layer in which a Hamilton fauna occurs, is a mass of shale differing in some respects from that above and below it. Though no sharp plane of limitation can be drawn at its base to separate it from the 200 (?) feet of barren black slate which is here the representative of the New York Genesee shale (so far as hitherto determined), yet a good physical distinction between the two is afforded in the field by the bleaching of the latter under the action of the air and light. This is so complete that a bank of weath-